

CLAIMS

What is claimed is:

- 1 1. A method for providing a seamless transition between video play-back modes,
2 comprising the steps of:
 - 3 storing a video stream in memory;
 - 4 receiving a request for a trick mode operation;
 - 5 responsive to receiving the request for a trick mode operation, using
6 information provided by a video decoder to identify a first
7 video picture to be decoded;
 - 8 decoding the first video picture; and
 - 9 outputting the first video picture to a display device.
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- 1 2. The method of claim 1, further comprising decoding and outputting a second
2 video picture, wherein the first video picture and the second video picture are
3 part of a group of pictures.
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- 1 3. The method of claim 1, wherein the information provided by the video
2 decoder is a time value that is associated with the first video picture.
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- 1 4. The method of claim 1, wherein the first video picture is adjacent in display
2 order to another video picture that was being output to the display device
3 when the request for the trick mode operation was received.
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- 1 5. The method of claim 1, wherein the video stream is received from a headend.
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- 1 6. The method of claim 1, wherein the memory is a non-volatile memory.
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- 1 7. The method of claim 1, further comprising storing information related to the
2 video stream in memory.
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- 1 8. The method of claim 7, wherein a demultiplexing system uses data embedded
2 in the video stream to generate the information related to the video stream.
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- 1 9. The method of claim 7, wherein the information related to the video stream
2 comprises an index table.
 - 1 10. The method of claim 9, wherein the index table identifies when each of a
2 plurality of pictures within the video stream was stored in memory relative to
3 a point in time.
 - 1 11. The method of claim 10, wherein the point in time corresponds to when
2 recording of the video stream commences.
 - 1 12. The method of claim 9, wherein the index table associates time values with
2 respective video pictures within the video stream.
 - 1 13. The method of claim 9, wherein the index table associates values with
2 respective video pictures within the video stream, the values being indicative
3 of a display order of the pictures within the video stream.
 - 1 14. The method of claim 9, wherein the index table identifies storage locations of
2 respective picture start codes.
 - 1 15. The method of claim 9, wherein the index table identifies picture types.
 - 1 16. The method of claim 9, wherein the index table identifies storage locations of
2 respective sequence headers.
 - 1 17. The method of claim 1, wherein the trick mode operation is one of a fast play
2 mode, a rewind mode, or a play mode.
 - 1 18. The method of claim 1, wherein the information provided by the video decoder
2 identifies a normal playback time required to reach the first video picture from
3 a beginning of the video stream.
 - 1 19. The method of claim 1, further comprising:
2 examining information in an index table;

3 examining annotation data corresponding to the video stream; and
4 determining an entry point for fulfilling the trick mode request
5 responsive to the annotation data and the information in the
6 index table.

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1 20. The method of claim 1, wherein the method is implemented by a television set-
2 top terminal, and wherein the display device is a television.

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1 21. A method comprising the steps of:
2 receiving a first video stream from a video server, the video stream
3 comprising a plurality of video pictures;
4 decoding a current video picture from among the plurality of video
5 pictures;
6 receiving user input requesting a trick-mode operation;
7 transmitting a value associated with the current video picture and
8 information identifying the trick mode operation to the video
9 server; and
10 receiving from the video server a second video stream configured to
11 enable a seamless transition to the trick-mode operation.

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1 22. The method of claim 21, wherein the value associated with the current video
2 picture is a time value.

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1 23. The method of claim 22, wherein the time value is relative to a beginning of
2 the first video stream.

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1 24. The method of claim 21, wherein the value associated with the current video
2 picture enables identification of a storage location corresponding to the video
3 picture.

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1 25. The method of claim 21, wherein the trick mode operation is one of a fast play
2 mode, a rewind mode, or a play mode.

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- 1 26. The method of claim 21, wherein:
 - 2 the method is implemented by a television set-top terminal;
 - 3 the display device is a television; and
 - 4 the video server is located at a headend.
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- 1 27. The method of claim 21, wherein one of the video pictures in the second video stream is temporally adjacent to the current video picture.
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- 1 28. A method for providing a seamless transition between video play-back modes, comprising the steps of:
 - 3 decoding a current video picture;
 - 4 parsing a stuffing transport packet (STP) comprising a time value corresponding to the current video picture; and
 - 5 storing the time value in memory.
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- 1 29. The method of claim 28, further comprising:
 - 2 using the time value to identify a location from which to begin a trick mode operation within a video presentation.
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- 1 30. The method of claim 29, wherein the location corresponds to the current video picture.
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- 1 31. The method of claim 29, wherein the location corresponds to a video picture that is adjacent in display order to the current video picture.
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- 1 32. The method of claim 28, wherein the trick mode operation is one of a fast play mode, a rewind mode, or a play mode.
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- 1 33. The method of claim 28, wherein the time value is correlated to a normal play-time from a beginning of a video stream to the current video picture.
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- 1 34. The method of claim 28, wherein the method is implemented by a video decoder.

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- 1 35. A system for providing a seamless transition between video play-back modes,
2 comprising:

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a memory device for storing a video stream that includes a current
4 video picture;
5 a processor that is coupled to the memory device; and
6 a video decoder that is coupled to the processor, and that is configured
7 to:
8 decode the current video picture,
9 parse a stuffing transport packet (STP) that includes a time
10 value corresponding to the current video picture, and
11 store the time value.

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- 1 36. The system of claim 35, wherein the processor is programmed to use the time
2 value to identify a location from which to begin a trick mode operation within
3 a video presentation.

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- 1 37. The system of claim 36, wherein the location corresponds to the current video
2 picture.

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- 1 38. The system of claim 36, wherein the location corresponds to a video picture
2 that is adjacent in display order to the current video picture.

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- 1 39. The system of claim 35, wherein the trick mode operation is one of a fast play
2 mode, a rewind mode, or a play mode.

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- 1 40. The system of claim 35, wherein the time value is correlated to a normal play-
2 time from a beginning of the video stream to the current video picture.

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- 1 41. A method for providing a seamless transition between video play-back modes,
2 comprising the steps of:

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storing a video stream in memory;
4 storing information related to the video stream in memory;
5 receiving a request for a trick mode operation;

6 responsive to receiving the request for a trick mode operation, using
7 information provided by a video decoder to identify a first
8 video picture to be decoded;
9 decoding the first video picture;
10 outputting the first video picture to a display device;
11 decoding and outputting a second video picture, wherein the first video
12 picture and the second video picture are part of a group of
13 pictures;
14 wherein the information provided by the video decoder is a time value
15 that is associated with the first video picture;
16 wherein the first video picture is adjacent in display order to another
17 video picture that was being output to the display device when
18 the request for the trick mode operation was received;
19 wherein the video stream is received from a headend;
20 wherein the memory is a non-volatile memory;
21 wherein the information related to the video stream comprises an index
22 table;
23 wherein the index table associates time values with respective video
24 pictures within the video stream;
25 wherein the index table identifies storage locations of respective
26 picture start codes;
27 wherein the index table identifies picture types;
28 wherein the index table identifies storage locations of respective
29 sequence headers;
30 wherein the trick mode operation is one of a fast play mode, a rewind
31 mode, or a play mode;
32 wherein the information provided by the video decoder identifies a
33 normal playback time required to reach the first video picture
34 from a beginning of the video stream;
35 wherein in response to the request, a processor reads information in an
36 index table and determines an entry point for fulfilling the trick
37 mode request; and
38 wherein the method is implemented by a television set-top terminal.